UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,231	04/14/2006	Atsushi Yabe	4700.P0327US	7188

23474 7590 01/05/2010

FLYNN THIEL BOUTELL & TANIS, P.C.
2026 RAMBLING ROAD
KALAMAZOO, MI 49008-1631

EXAMINER	
BAREFORD, KATHERINE A	

ART UNIT	PAPER NUMBER
1792	

MAIL DATE	DELIVERY MODE
01/05/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/576,231	YABE ET AL.	
	Examiner	Art Unit	
	Katherine A. Bareford	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment of October 14, 2009 has been received and entered. With the entry of the amendment, claim 4 is canceled, and claims 1-3, 5-7 and new claims 8-9 are pending for examination.

Specification

2. The substitute specification filed August 11, 2008 has been approved by the Examiner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not

commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-2, 5-6 and 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shipley, Jr. et al (US 3329512) in view of Verbunt (US 2004/0152303), Kondo et al (US 4834796) and Yoshida et al (US 2002/0011176).

Shipley teaches an electroless copper plating solution. Column 1, lines 10-15. The plating solution contains a water-soluble nitrogen containing polymer. Column 2, lines 15-25 and column 2, line 65 through column 3, line 10 (polyvinylpyrrolidone, polyacrylimides, for example) and column 5, lines 15-50 (examples (3), (4), (9), (10) and (11)). Shipley further teaches that electroless copper solutions will contain a reducing agent of formaledyde. Column 2, lines 15-20. Shipley provides that the concentratin of the formaldehyde is prefably below about 0.6 molar (mol/l). Column 4, lines 45-50. Shipley further provides that the concentration of the polymer in the solution is desirably 0.002 g/l to 3.0 g/l (column 3, lines 10-20), including 20 ppm (0.02 g/l), 25 ppm (0.025 g/l) or 50 ppm (0.05 g/l) (see polymers (3), (4), (9), (10), (11), column 5, lines 25-45, and Tables II-VI, amounts used, ccolumn 6).

Claims 2, 6: the water soluble nitrogen containing polymer can be a polyacrylamide. Column 2, line 65 through column 3, line 2 and column 5, lines 40-45.

Claim 5: a copper plating method to deposit copper on a substrate is provided using the electroless copper plating solution with the water soluble nitrogen containing polymer. See claim 20.

Claim 8: the copper is provided as copper sulfate. Column 4, lines 25-30.

Claim 9: a complexing agent of a sodium salt of ethylenediamine tetraacetic acid can be provided. Column 4, lines 30-35. The Examiner takes Official Notice that a conventional sodium salt of ethylenediamine tetracetic acid for equivalent complexing use in the art would be disodium ethylenediaminetetraacetate. If applicant disagrees, he should so respond on the record. Therefore, one of ordinary skill in the art would expect similar complexing results from using disodium ethylenediaminetetraacetate in the copper plating solution of Shipley.

Shipley provides all the features of these claims, except the reducing agent made from glyoxylic acid and phosphinic acid and the concentration of the components (claim 1, 6).

Verbunt teaches that when providing electroless copper plating solutions, it is well known to provide that the reducing agent can be made up of a variety of reducing agents and their mixtures, including using the combination of glyoxylic acid and hypophosphite. Paragraph [0026]. Verbunt further teaches that the source of hypophosphite can be hypophosphorous acid (which the Examiner takes Official Notice is another name for phosphinic acid). Paragraph [0026]. As a result, Verbunt would

include combinations of glyoxylic acid and hypophosphorous acid as the reducing agent.

Kondo teaches that when providing electroless copper plating solutions, it is known that hypophosphite can be provided with a formalin (a solution of formaldehyde) reducing agent, and that this allows (1) a reduction in the amount of formalin used, and (2) an acceleration of plating reaction with used with TEA containing baths. See column 13, line 25 through column 14, line 10 and Figure 9. Kondo provides that the amount of hypophosphite used can be 0.1 M (mol/liter) in combination with ranges of about 0.5 M to 0.2 M of formalin. Column 13, lines 45-50 and figures 9-10.

Yoshida teaches that glyoxylic acid is a known replacement for formalin (a solution of formaldehyde) as a reducing agent in electroless copper plating, where glyoxylic acid has a structure similar to that of formalin and is believed to have an oxidation reaction mechanism similar to formalin, but that glyoxylic acid plating proceeds more slowly that of formalin. See paragraphs [0005] – [0007].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Shipley to provide that the reducing agent is made up of a combination of glyoxylic acid and hypophosphorous acid (phosphinic acid) as suggested by Verbunt, Kondo and Yoshida with an expectation of desirable accelerated and safer plating results, because Shipley teaches to use a copper electroless plating system with a reducing agent of formalehyde, and Verbunt teaches that a desirable

reducing agent system for a copper electroless plating solution would be a combination of glyoxylic acid and hypophosphorous acid; especially noting to use glyoxylic acid (paragraph [0026]), with Kondo suggesting to add hypophosphite (or hypophosphorous acid as a described equivalent by Verbant) to formalin (formaldehyde) containing copper electroless plating solutions to remove undesired material and accelerate the bath if TEA also used, and Yoshida shows that glyoxylic acid would be expected to act in the same fashion as formalin only more slowly and providing a desirable and safer replacement for formaldehyde, thus suggesting that glyoxylic acid would also be accelerated by hypophosphite as described by Kondo and be desirably accelerated due its slow reaction, furthermore given the equivalent use of the formalin and glyxoylic acid; and hypophosphorous acid and hypophosphite; one would be suggested to use the same amounts of each respective material, and therefore from the amounts suggested by Kondo of, for example, 0.1 mol/liter hypophosphite and 0.1 mol/liter formalin, 0.1 mol/liter hypophosphorous (phosphinic) acid and 0.1 mol/liter glyoxylic acid would be suggested for use.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shipley in view of Verbunt, Kondo and Yoshida as applied to claims 1-2, 5-6 and 8-9 above, and further evidenced by Amelio et al (US 4655833).

Shipley in view of Verbunt, Kondo and Yoshida teaches all the features of these claims except the molecular weight and weight ratio. Shipley does teach that molecular

weight of the polymers is not critical and that very high molecular weights can be used. Column 3, lines 1-5. Further, Shipley teaches that RETEN 210 can be used as the polymer (column 5, lines 40-45).

However, Amelio does teach that the water soluble nitrogen containing polymer used can be, for example, Reten 210, Reten 220 or Reten 300 (column 2, lines 40-68) and that such polymers have a relatively high molecular weight of about 50,000-1,000,000 or more (column 3, lines 1-5).

Therefore, it further would have been obvious to have Shipley in view of Verbunt, Kondo and Yoshida use a water soluble nitrogen containing polymer with a molecular weight above 100,000, because Amelio evidences that the RETEN 210 of Shipley would have a molecular weight in a range of 50,000 -1,000,000 or more and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). As to the ratio of Mw over Mn, it is the Examiner's position that for the purposes of consistency and reproducibility it would have been obvious to use polymers of the same molecular weight, which would provide that the molecular weight and the number average molecular weight would be the same number, and therefore provide that Mw/Mn would be one, within the claimed range.

7. Claims 1-3, 5 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan 03-287779 (hereinafter '779) in view of Verbunt (US 2004/0152303), Kondo et al (US 4834796) and Yoshida et al (US 2002/0011176).

'779 teaches an electroless copper plating solution. Abstract. The plating solution contains a water-soluble nitrogen containing polymer. Abstract (polyethyleneimine would be water soluble as indicated by claim 2). '779 further teaches the electroless copper solutions will contain a reducing agent, giving an example of hydrazine, but the solution is not limited to these. Abstract. The concentration of polyethyleneimine is controlled to less than or equal to 4 times the number of mols of Cu complex ion used. Abstract.

Claim 2, 7: the water soluble nitrogen containing polymer can be a polyethyleneimine. Abstract.

Claim 8: the copper plating solution can use copper sulfate as a copper source. Abstract.

'779 teaches all the features of these claims, except (1) the reducing agent made from glyoxylic acid and phosphinic acid and its concentration (claim 1, 7), (2) the precise molecular weight, and Mw over Mn ratio (claim 3), (3) the actual plating (claim 5) and (4) the concentration of polymer used (claim 1). However, '779 does teach that the water soluble nitrogen containing polymer (polyethyleneimine) used have a molecular weight of several hundred to several hundred thousand. Abstract.

Verbunt teaches that when providing electroless copper plating solutions, it is well known to provide that the reducing agent can be made up of a variety of reducing agents and their mixtures, including using the combination of glyoxylic acid and hypophosphite. Paragraph [0026]. Verbunt further teaches that the source of hypophosphite can be hypophosphorous acid (which the Examiner takes Official Notice is another name for phosphinic acid). Paragraph [0026]. As a result, Verbunt would include combinations of glyoxylic acid and hypophosphorous acid as the reducing agent.

Kondo teaches that when providing electroless copper plating solutions, it is known that hypophosphite can be provided with a formalin (a solution of formaldehyde) reducing agent, and that this allows (1) a reduction in the amount of formalin used, and (2) an acceleration of plating reaction with used with TEA containing baths. See column 13, line 25 through column 14, line 10 and Figure 9. Kondo provides that the amount of hypophosphite used can be 0.1 M (mol/liter) in combination with ranges of about 0.5 M to 0.2 M of formalin. Column 13, lines 45-50 and figures 9-10.

Yoshida teaches that glyoxylic acid is a known replacement for formalin (a solution of formaldehyde) as a reducing agent in electroless copper plating, where glyoxylic acid has a structure similar to that of formalin and is believed to have an oxidation reaction mechanism similar to formalin, but that glyoxylic acid plating proceeds more slowly that of formalin. See paragraphs [0005]—[0007].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '779 to provide that the reducing agent is made up of a combination of glyoxylic acid and hypophosphorous acid (phosphinic acid) as suggested by Verbunt with an expectation of desirable plating results, because '779 teaches to use a copper electroless plating system with a reducing agent, and Verbunt teaches that a desirable reducing agent system for a copper electroless plating solution would be a combination of glyoxylic acid and hypophosphorous acid. It would further have been obvious to modify '779 in view of Verbunt to use a water soluble nitrogen containing polymer with a molecular weight above 100,000, because '779 teaches a range of several hundred to several hundred thousand and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). As to the ratio of Mw over Mn, it is the Examiner's position that for the purposes of consistency and reproducibility it would have been obvious to use polymers of the same molecular weight, which would provide that the molecular weight and the number average molecular weight would be the same number, and therefore provide that Mw/Mn would be one, within the claimed range. As to the plating with the provided copper plating bath, it is the Examiner's position that it would have been obvious to use an electroless copper plating bath to actually plate copper, as that is the purpose that the bath is provided for. As to the concentration of polymer and reducing agent components used, it would have been obvious to modify '779 in view of Verbunt

to use concentrations of copper and reducing agent as suggested by Kondo and Yoshida, as Verbunt indicates that components of glyoxylic acid and hypophosphorous acid can be used, and with Kondo suggesting to add hypophosphite (or hypophosphorous acid as a described equivalent by Verbunt) to formalin (formaldehyde) containing copper electroless plating solutions to remove undesired material and accelerate the bath if TEA also used, and Yoshida shows that glyoxylic acid would be expected to act in the same fashion as formalin only more slowly and providing a desirable and safer replacement for formaldehyde, thus suggesting that glyoxylic acid would also be accelerated by hypophosphite as described by Kondo and be desirably accelerated due its slow reaction, furthermore given the equivalent use of the formalin and glyxoylic acid; and hypophosphorous acid and hypophosphite; one would be suggested to use the same amounts of each respective material, and therefore from the amounts suggested by Kondo of, for example, 0.1 mol/liter hypophosphite and 0.1 mol/liter formalin, 0.1 mol/liter hypophosphorous (phosphinic) acid and 0.1 mol/liter glyoxylic acid would be suggested for use; and Verbunt also suggests using 0.02 to 0.06 M copper ion that can come from copper sulfate as described by '779 (paragraph [0025]) and '779 provides using 4 x or less the amount of copper mols of the polyethyeneimine, which would overlap with the amount of polymer claimed, and In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 1-2 and 5-9 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 of copending Application No. 12/075,745, alone, OR alternatively, in view of Shipley, Jr. et al (US 3329512), Verbunt (US 2004/0152303), Kondo et al (US 4834796) and Yoshida et al (US 2002/0011176). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of 12/075,745 teach an electroless plating method (and corresponding solution as used in the method) where an electroless copper plating solution is provided with glyoxylic acid and phosphinic acid

used as the reducing agents (claims 1-2 of '745), and the solution also contains a water soluble nitrogen-containing polymer, that can be polyacrylamide or polyethyleneimine (claims 1, 3 of '745), and as to the concentration of the polymer, glyxoylic acid and phosphinic acid (claim 1), the use of copper sulfate (claim 8) and the use of ethylenediaminetetraacetate (claim 9)-- (A) using 12/075,745 alone, MPEP 804 (II)(B)(1) indicates that "Further, those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in the application defines an obvious variation of an invention claimed in the patent. In re Vogel, 422 F.2d 438, 441-42, 164 USPQ 619, 622 (CCPA 1970)." Therefore, to see whether the concentration of polymer, gyloxylic acid, and phosphinic acid claimed is simply an obvious variation of the invention claimed in 12/075,745 it would be acceptable to look to the specification. The specification of 12/075,745 provides using the ranges of polymer, gyloxylic acid and phosphinic acid as claimed. See paragraphs [0018], [0021] of the published specification. As to using copper sulfate, a source of copper ions would need to be provided to give the claimed copper plating, and the Examiner takes Official Notice that copper sulfate is a conventional source of copper ions for copper electroless plating, which would therefore be a suggested source of copper ions for plating in the copper plating solution of 12/074,745 with an expectation of desirable plating results. As to using ethylenediaminetetraacetate, the Examiner takes Official Notice that it is well known to provide complexing agents such as ethylenediaminetetraacetate in copper electroless plating solutions, and thus would

suggest the use of such material in the copper plating solution of 12/075,745 with an expectation of desirable plating results. (B) Alternatively, further using 12/075,745 in view of Shipley, Verbunt, Kondo and Yoshida, the claims of 12/075,745 provide using polymer, gyloxylic acid and phosphinic acid and the combination of Shipley, Verbunt, Kondo and Yoshida providing the suggestion to use the claimed amounts of these materials for the reasons given in paragraph 5 above. Shipley and Verbunt also show the conventional use of copper sulfate to provide copper ions for the electroless plating solution (column 4, lines 25-30 and paragraph [0025], respectively), which would therefore be a suggested source of copper ions for plating in the copper plating solution of 12/074,745 with an expectation of desirable plating results. As to using ethylenediaminetetraacetate, the Examiner takes Official Notice that it is well known to provide complexing agents such as ethylenediaminetetraacetate in copper electroless plating solutions, and thus would suggest the use of such material in the copper plating solution of 12/075,745 with an expectation of desirable plating results.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

10. The PGPub for 12/075,745 is US 2008/0224313.

11. Greenberg et al (US 3993845) indicates the use of ethylenediamine tetraacetic acid and disodium ethylenediaminetetraacetate as complexing agents. Column 3, lines 10-15.

Response to Arguments

12. Applicant's arguments filed October 14, 2009 have been fully considered but they are not persuasive.

Applicant argues that the present invention is patently distinguishable from the the 35 USC 103 rejections made by the Examiner, with the present claims requiring specific amounts of the polymer, glyoxylic acid and phosphinic acid, and in the bath composition of Verbunt, glyoxylic acid and phosphinic acid are used as reducing agents, and no water-soluble nitrogen polymer is added, which is similar to the bath composition of Comparative Example 1 of the present invention, which provides a problematic plating. According to applicant, the bath composition in '779 contains formalin as a reducing agent and polyethylene as a water soluble nitrogen-containing polymer, which is similar to Example 5 of the present specification, however, the plating film formed from this bath has little islands and many portions without deposition. According to applicant unlike '779 and Example 4 of the present specification, both glyoxylic acid and phosphinic acid are required to be present, which provides superior results. As to the Examiner's response to the arguments regarding '779 and its use of hydrazine, as pointed out by the Examiner, applicant argues that the references have shown that hydrazine is equivalent to glyoxylic acid, phosphinic acid or other reducing agents, and does not suggest that any advantage would be gained by using one reducing agent over the other.

The Examiner has reviewed these arguments, however, the rejection is maintained. After applicant's amendments, two sets of 35 USC 103 rejections remain, one with Shipley as the primary reference and one with '779 as the primary reference. As to the rejections using Shipley, the Examiner notes that Shipley provides an electroless copper plating solution that uses a water soluble nitrogen containing polymer with amounts in the claimed range. As to the use of glyoxylic acid and phosphinic acid as the reducing agent, the further references to Verbunt, Kondo and Yoshida, show not only the known use of glyoxylic acid and phosphinic acid as reducing agents, but also that the combination of references would show the desired use of the combination of glyoxylic acid and phosphinic acid in the claimed amounts to provide an accelerated reaction, and The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Therefore, one of ordinary skill in the art would already expect beneficial results from the combination of references as claimed. While Verbunt does not provide the use of the water-soluble nitrogen containing polymer as claimed, the primary reference to Shipley does, and therefore, comparisons to a comparative example without the polymer are not relevant to the combination that suggests having such polymers. As to the rejections using '779, the Examiner notes that applicant refers to '779 using formalin as a reducing agent. However, the abstract of '779 refers to using hydrazine as a reducing agent, not

formalin. Furthermore, the further references to Verbunt, Kondo and Yoshida show not only the known use of glyoxylic acid and phosphinic acid as reducing agents, but also that the combination of references would show the desired use of the combination of glyoxylic acid and phosphinic acid in the claimed amounts to provide an accelerated reaction, and The fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Furthermore, as to the replacement of hydrazine with glyoxylic acid/phosphinic acid with an expectation of at least similar results, applicant has made no showing that the process of using the glyoxylic acid/phosphinic acid has unexpectedly better results than that using hydrazine, as no comparision has been made with hydrazine. Applicant argues that the references used by the Examiner (apparently meaning Verbunt) have shown that hydrazine is equivalent to glyoxylic acid, phosphinic acid or other reducing agents and does not suggest that any advantage would be gained by using one reducing agent over another. The Examiner notes that Verbunt says to use glyoxylic acid, phosphinic acid, hydrazine rather than formaldehyde (paragraph [0026]). Thus, if these three (glyoxylic acid, phosphinic acid, hydrazine) are what can be considered equivalent by Verbunt, applicant has made no showing of using polyethyleneimine and any one of the three alone and showing that it is not equivalent. Furthermore, as noted the further use of

Kondo and Yoshida provides the suggestion to specifically use the combination of glyoxylic acid/phosphinic acid alone.

As to the provisional obviousness-type double patenting rejections, claims 1-2 and 5-9 are obvious for the reasons given in the obviousness type double patenting rejection using 12/075,745 above, with the specific components and specific ranges claimed suggested as discussed in the rejection above.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine A. Bareford/
Primary Examiner, Art Unit 1792